

DATA BULLETIN

*Accuracy of TOC concentrations in mineral water measured with the **acquray**[®] TOC*

Besides a high precision, which is given by the **acquray** TOC, the accuracy of the results is of great importance for analytical purposes. The method of standard addition with mineral water was used to provide proof that the **acquray** TOC is a perfect solution for TOC analysis in drinking water.

For the experiment, four bottles of a commercial mineral water have been used. From three bottles, sample aliquots were taken and then an amount of potassium hydrogen phthalate standard solution was added to each sample, which resulted in 0.25 ppm, 0.5 ppm, and 1 ppm more TOC, respectively. One bottle was used for cleaning. The used mineral water usually has a NPOC concentration between 0.15 and 0.2 ppm, which was independently tested.

The NPOC concentrations of the mineral water and the spiked samples have been determined in the same run to guarantee similar testing conditions. The results have been evaluated using a calibration between 0.1 ppm and 2 ppm, which was split into two different measurement ranges.

The NPOC concentrations of the mineral water were in line with the expected values even if small deviations could be observed between the four different bottles, which have been used (Table 1).

OVERVIEW

Excellent accuracy for TOC analyses in mineral water with standard addition using the **acquray**[®] TOC.

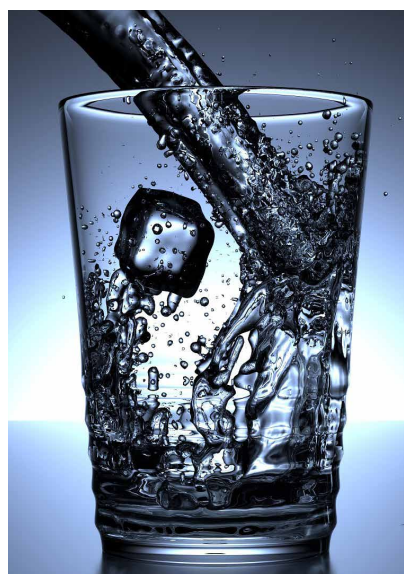


Table 1. NPOC concentration of the four bottles of mineral water.

SAMPLE	NPOC [mg/l]
mineral water bottle 1, used for cleaning	0.174
mineral water bottle 2, used to prepare the 1 ppm TOC standard	0.181
mineral water bottle 3, used to prepare the 0.5 ppm TOC standard	0.179
mineral water bottle 4, used to prepare the 0.25 ppm TOC standard	0.164

Table 2 shows the results for the standard addition. To exclude systematic errors caused by sample injection, different typical injection volumes have been tested for the lower and upper measurement range. For the concentration range above 1 ppm injection volumes below 10 ml are typically used.

Table 2. Results of the TOC analyses with the **acquray** TOC.

SAMPLE	INJECTION VOLUME [ml]	EXPECTED TOC CONCENTRATION [mg/l]	MEASURED TOC CONCENTRATION [mg/l]	ACCURACY [mg/l]
mineral water + 0.25 ppm	4	0.414	0.413 ± 0.004	-0.001
mineral water + 0.25 ppm	7	0.414	0.413 ± 0.020	-0.001
mineral water + 0.25 ppm	10	0.414	0.403 ± 0.009	-0.011
mineral water + 0.5 ppm	4	0.679	0.686 ± 0.021	+ 0.007
mineral water + 0.5 ppm	7	0.679	0.679 ± 0.013	+ 0.000
mineral water + 0.5 ppm	10	0.679	0.657 ± 0.010	-0.034
mineral water + 1 ppm	4	1.181	1.174 ± 0.014	-0.007
mineral water + 1 ppm	7	1.181	1.190 ± 0.062	+0.009

Conclusion

The mean accuracy of the results of the **acquray** TOC is -0.005 ppm and therefore fulfills highest quality criteria. Accordingly, the analysis of drinking water is perfectly realized with the **acquray** TOC. The **acquray** TOC fulfills the requirements of the international standard ISO 8245 on "Water quality – Guidelines for the determination of total organic carbon (TOC) and dissolved organic carbon (DOC)".



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